

What is claimed is:

1. Apparatus for the design of logic circuits, comprising:
  - a. a computer, and
  - b. software stored on the computer for
    - b1. representing multilevel logic schema in vector form; and for
    - b2. simplifying multilevel logic schema into a simplified form by exploiting symmetries in the logical schema.
2. The apparatus of claim 1 in which simplifying multilevel logic schema comprises eliminating opposing couples.
3. A method of reducing multilevel logic to simpler form comprising the steps of:
  - a. representing the logic in vector form; and
  - b. removing redundancy by eliminating opposing couples.
4. The method of claim 3 further comprising the step of:
  - c. sliding symmetrical portions of the logic attached to opposing couples onto a point common to the opposing couples.
5. A system for the design or manufacturing of logical circuits, comprising:
  - a. a plurality of computers connected to a network;
  - b. at least one of said computers having software stored thereof for
    - b1. representing multilevel logic schema in vector form; and for
    - b2. simplifying multilevel logic schema into a simplified form by exploiting symmetries in a logical schema.
6. The system of claim 5 in which a computer having said software communicates logical schema to one or more other computing devices.
7. The system of claim 5 in which the software eliminates opposing couples in simplifying multilevel logic.
8. A computer program product, comprising:
  - a. a computer readable storage medium; and
  - b. at least one computer program stored on said storage medium, said at least one computer program comprising instructions for:
    - b1. representing multilevel logic schema in vector form; and for
    - b2. simplifying multilevel logic schema into a simplified form by exploiting symmetries in the logical schema.
9. A computer program product, comprising:
  - a. a computer readable storage medium; and
  - b. at least one computer program stored on said storage medium, said at least one computer program comprising instructions for:

- b1. representing the logic in vector form; and
  - b2. removing redundancy by eliminating opposing couples.
- 10. A method of manufacturing integrated circuits comprising the steps of:
  - a. representing at least a portion of the logic circuits to be incorporated into the integrated circuit in vector form; and
  - b. simplifying the logic by removing redundancy by eliminating opposing couples.
- 11. A method of manufacturing integrated circuits comprising the steps of:
  - a. representing at least a portion of the logic circuits to be incorporated into the integrated circuit in vector form; and
  - b. simplifying the logic by removing redundancy by exploiting symmetries in the logical schema.
- 12. A method of reducing multilevel logic to simpler form comprising the steps of:
  - a. representing the logic in vector form;
  - b. identifying opposing couples having at least symmetrical logic comprising some similarities in logical expression that connects to them;
  - c. removing redundancy by eliminating an opposing couples and sliding the symmetrical logic attached to opposing couples onto a point common to the opposing couples.